What is Claimed is:

1. A powder batch comprising electroluminescent phosphor particles, wherein said particles have a weight average particle size of from about 0.1 μm to about 10 μm and have a substantially spherical morphology, wherein at least about 80 weight percent of said particles are not larger than about two times said average particle size.

2. A powder batch as recited in Claim 1, wherein said particles have a weight average particle size of from about 0.3 μm to about 5 μm.

3. A powder batch as recited in Claim 1, wherein said particles comprise ZnS.

4. A powder batch as recited in Claim 3, wherein said particles comprise a dopant selected from the group consisting of Au, Al, Cu and combinations thereof.

5. A powder batch as recited in Claim 3, wherein said particles comprise a dopant selected from the group consisting of Ag, Cl and combinations thereof.

6. A powder batch as recited in Claim 3, wherein said particles comprise Mn.

7. A powder batch as recited in Claim 1, wherein said particles comprise M^1S wherein M^1 is selected from the group consisting of Ca, Sr and combinations thereof.

8. A powder batch as recited in Claim 7, wherein said particles comprise a dopant selected from the group consisting of Eu, Ce and combinations thereof.

9. A powder batch as recited in Claim 1, wherein said particles comprise $M^2Ga_2S_4$ wherein M^2 is selected from the group consisting of Ca, Sr and combinations thereof.

10. A powder batch as recited in Claim 9, wherein said particles comprise a dopant selected from the group consisting of Eu, Ce and combinations thereof.

11. A powder batch as recited in Claim 1, wherein said particles comprise $ZnGa_2O_4$ and a dopant selected from the group consisting of Mn and Cr.

12. A powder batch as recited in Claim 1, wherein said particles comprise $M^3Ga_2O_4$ wherein M^3 is selected from the group consisting of Ca and Sr and a dopant selected from the group consisting of Ce and Eu.

13. A powder batch as recited in Claim 1, wherein said particles comprise Y_2O_3 and a rare earth dopant.

14. A powder batch as recited in Claim 1, wherein said particles comprise Ga_2O_3

and a dopant selected from the group consisting of Dy and Eu.

15. A powder batch as recited in Claim 1, wherein said particles comprise $Ca_3Ga_2O_6$:Eu.

16. A powder batch as recited in Claim 1, wherein said particles comprise Zn_2GeO_4:Mn.

17. A powder batch as recited in Claim 1, wherein said particles comprise $Zn_2(Ge,Si)O_4$:Mn.

18. A powder batch as recited in Claim 1, wherein at least about 90 weight percent of said particles are not larger than about two times said average particle size.

19. A powder batch as recited in Claim 1, wherein said particles are comprised of crystallites having an average crystallite size of at least about 25 nanometers.

20. A powder batch comprising electroluminescent ZnS phosphor particles, wherein said particles have a weight average particle size of from about 0.1 μm to about 10 μm and wherein said particles are substantially spherical and wherein at least about 80 weight percent of said particles are not larger than about two times said average particle size.

21. A powder batch as recited in Claim 20, wherein said particles have a weight average particle size of from about 0.3 μm to about 5 μm.

22. A powder batch as recited in Claim 20, wherein said particles comprise a dopant selected from the group consisting of Au, Al, Cu, Ag, Cl and combinations thereof.

23. A powder batch as recited in Claim 20, wherein said particles comprise Mn.

24. A powder batch as recited in Claim 20, wherein said particles have a dopant concentration of from about 0.05 to about 5 weight percent.

25. A powder batch as recited in Claim 20, wherein said particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

26. A powder batch comprising electroluminescent M^1S phosphor particles wherein M^1 is selected from the group consisting of Ca, Sr and combinations thereof, and wherein said particles have a weight average particle size of from about 0.1 μm to about 10 μm and wherein at least about 80 weight percent of said particles are not larger than about two times said average particle size.

27. A powder batch as recited in Claim 26, wherein said particles have a weight average particle size of from about 0.3 μm to about 5 μm.

28. A powder batch as recited in Claim 26, wherein said particles comprise a dopant selected from the group consisting of Ce, Eu and combinations thereof.

29. A powder batch as recited in Claim 26, wherein said particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

30. A powder batch as recited in Claim 26, wherein said particles are substantially spherical.

31. A powder batch comprising electroluminescent $M^2Ga_2S_4$ phosphor particles, wherein said M^2 is selected from the group consisting of Ca, Sr and combinations thereof, and wherein said particles have a weight average particle size of from about 0.1 μm to about 10 μm.

32. A powder batch as recited in Claim 31, wherein at least about 80 weight percent of said particles are not larger than about two times said average particle size.

33. A powder batch as recited in Claim 31, wherein said particles have a weight average particle size of from about 0.3 μm to about 5 μm.

34. A powder batch as recited in Claim 31, wherein said particles comprise a dopant selected from the group consisting of Eu, Ce and combinations thereof.

35. A powder batch as recited in Claim 31, wherein said particles are comprised of crystallites having an average crystallite size of at least about 25 nanometers.

36. A powder batch as recited in Claim 31, wherein said particles are substantially spherical.

37. A powder batch comprising electroluminescent phosphor particles of the form $M^3Ga_xO_y$, wherein M^3 is selected from the group consisting of Sr, Ca and Zn wherein said particles have a weight average particle size of from about 0.1 to about 10 μm and wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

38. A powder batch as recited in Claim 37, wherein M^3 is Sr and said phosphor particles further comprise Eu.

39. A powder batch as recited in Claim 37, wherein M^3 is Ca and said phosphor particles further comprise Ce.

40. A flowable medium suitable for applying electroluminescent phosphor particles onto a substrate, comprising:

a) a liquid vehicle phase; and

b) a functional phase dispersed throughout said liquid vehicle phase, said functional phase comprising electroluminescent phosphor particles, wherein said phosphor particles are substantially spherical and have a weight average particle size of not greater than about 5 μm.

41. A flowable medium as recited in Claim 40, wherein said phosphor particles have a particle size distribution wherein at least about 80 weight percent of said phosphor particles are not larger than twice said average particle size.

42. A flowable medium as recited in Claim 40, wherein said vehicle phase is an aqueous-based solution.

43. A flowable medium as recited in Claim 40, wherein said vehicle phase is an aqueous-based solution comprising a dispersing agent.

44. A flowable medium as recited in Claim 40, wherein said flowable medium comprises from about 5 to about 95 weight percent of said electroluminescent phosphor particles.

45. A flowable medium as recited in Claim 40, wherein said flowable medium comprises from about 60 to about 85 weight percent of said electroluminescent phosphor particles.

46. A flowable medium as recited in Claim 40, wherein said phosphor particles comprise ZnS.

47. A flowable medium as recited in Claim 40, wherein said phosphor particles comprise M^1S, wherein M^1 is selected from the group consisting of Sr, Ca and combinations thereof.

48. A flowable medium as recited in Claim 40, wherein said phosphor particles comprise $M^2Ga_2S_4$, wherein M^2 is selected from the group consisting of Sr, Ca and combinations thereof.

49. A paste composition suitable for applying electroluminescent phosphor particles onto a substrate, comprising:

a) a liquid vehicle phase; and

b) a functional phase dispersed throughout said vehicle phase, said functional phase comprising electroluminescent phosphor particles having a weight average particle size of not greater than about 5 μm and a particle size distribution wherein at least about 80 weight percent of said particles are not larger than twice said average particle size.

50. A paste composition as recited in Claim 49, wherein said phosphor particles are substantially spherical.

51. A paste composition as recited in Claim 49, wherein said phosphor particles comprise ZnS.

52. A paste composition as recited in Claim 49, wherein said phosphor particles comprise M^1S, wherein M^1 is selected from the group consisting of Sr, Ca and combinations thereof.

53. A paste composition as recited in Claim 49, wherein said phosphor particles comprise $M^2Ga_2S_4$, wherein M^2 is selected from the group consisting of Sr, Ca and combinations thereof.

54. An electroluminescent device, comprising an electrically insulative substrate, a first electrode supported on said substrate, a phosphor layer disposed over said first electrode, a second electrode disposed over said phosphor layer, and means for applying an electric field between said first and second electrodes, wherein said phosphor layer comprises an electroluminescent phosphor powder comprising electroluminescent phosphor particles, wherein said phosphor particles are substantially spherical and have a weight average particle size of not greater than about 5 μm.

55. An electroluminescent device as recited in Claim 54, wherein at least about 80 weight percent of said phosphor particles are not larger than twice said average particle size.

56. An electroluminescent device as recited in Claim 54, wherein said average particle size is from about 0.3 to about 3 μm.

57. An electroluminescent device as recited in Claim 54, wherein said phosphor particles comprise ZnS.

58. An electroluminescent device as recited in Claim 54, wherein said phosphor particles comprise M^1S, wherein M^1 is selected from the group consisting of Sr, Ca and mixtures thereof.

59. An electroluminescent device as recited in Claim 54, wherein said phosphor particles comprise $M^2Ga_2S_4$, wherein M^2 is selected from the group consisting of Sr, Ca and mixtures thereof.

60. An electroluminescent device as recited in Claim 54, wherein said phosphor particles are coated phosphor particles.

61. An electroluminescent device as recited in Claim 54, wherein said phosphor layer has a thickness that is not greater than about 3 times said average particle size.

62. An electroluminescent device as recited in Claim 54, wherein said device is an electroluminescent lamp.

63. An electroluminescent device as recited in Claim 54, wherein said device is an electroluminescent lamp and wherein said phosphor powder is dispersed in a flexible polymer.

64. An electroluminescent device as recited in Claim 54, wherein said device is

an electroluminescent lamp and wherein said phosphor powder is dispersed on a rigid substrate.

65. An electroluminescent device as recited in Claim 54, wherein said device is an electroluminescent display device.

66. An electroluminescent device as recited in Claim 54, wherein said device is an ACEL lamp and wherein said phosphor particles comprise $M^3Ga_xO_y$.

67. An electroluminescent device as recited in Claim 66, wherein M^3 is selected from Sr, Ca and Zn.

68. A method for the production of a electroluminescent phosphor powder batch, comprising the steps of:

a) forming a liquid comprising precursors to a electroluminescent phosphor compound;

b) generating an aerosol of droplets from said liquid;

c) pyrolyzing said droplets to remove liquid therefrom and at least partially react said precursors to form intermediate precursor particles; and

d) heating said intermediate precursor particles to form a powder batch of phosphor particles.

69. A method as recited in Claim 68, wherein said step of generating an aerosol comprises ultrasonically atomizing said liquid.

70. A method as recited in Claim 68, wherein said pyrolyzing step comprises pyrolyzing said droplets at a temperature of at least about 700°C.

71. A method as recited in Claim 68, wherein said heating step comprises heating to a temperature of from about 1100°C to about 1600°C.

72. A method as recited in Claim 68, wherein said heating step comprises the step of heating said intermediate precursor particles with agitation.

73. A method as recited in Claim 68, wherein said heating step comprises the step of heating said intermediate precursor particles with sufficient agitation to substantially prevent the formation of hard agglomerates in the phosphor powder.

74. A method as recited in Claim 68, wherein said heating step comprises heating said intermediate precursor particles in a rotary kiln.

75. A method as recited in Claim 68, wherein said intermediate precursor particles have a weight average particle size of not greater than about 5 μm.

76. A method as recited in Claim 68, wherein no more than about 0.1 weight percent of said phosphor particles are in the form of hard agglomerates.

77. A method as recited in Claim 68, wherein said phosphor particles have an average size of not greater than about 5 μm and wherein said particles have not been milled.

78. A method as recited in Claim 68, wherein said phosphor particles comprise ZnS.

79. A method as recited in Claim 68, wherein said phosphor particles comprise M^1S, wherein M^1 is selected from the group consisting of Sr, Ca and combinations thereof.

80. A method as recited in Claim 68, wherein said phosphor particles comprise $M^2Ga_2S_4$, wherein M^2 is selected from the group consisting of Sr, Ca and combinations thereof.

81. A method for the production of a phosphor powder batch comprising phosphor particles of the form M^1S, wherein M^1 is selected from the group consisting of Sr, Ca and combinations thereof, comprising the steps of:

a) forming a liquid comprising precursors to an M^1S electroluminescent phosphor compound;

b) generating an aerosol of droplets from said liquid;

c) pyrolyzing said droplets to remove liquid therefrom and at least partially react said precursors to form intermediate precursor particles; and

d) heating said intermediate precursor particles to form a powder batch of phosphor particles.

82. A method as recited in Claim 81, wherein said step of generating an aerosol comprises ultrasonically atomizing said liquid.

83. A method as recited in Claim 81, wherein said pyrolyzing step comprises pyrolyzing said droplets at a temperature of at least about 700°C.

84. A method as recited in Claim 81, wherein said heating step comprises heating to a temperature of from about 1100°C to about 1600°C.

85. A method as recited in Claim 81, wherein said heating step comprises heating in a sulfur-containing gas.

86. A method as recited in Claim 81, wherein said heating step comprises heating in H_2S gas.

87. A method as recited in Claim 81, wherein said heating step comprises the step of heating said intermediate precursor particles with agitation.

88. A method as recited in Claim 81, wherein said heating step comprises the step of heating said intermediate precursor particles with sufficient agitation to substantially prevent the formation of hard agglomerates in the phosphor powder.

89. A method as recited in Claim 81, wherein said heating step comprises

heating said intermediate precursor particles in a rotary kiln.

90. A method as recited in Claim 81, wherein said intermediate precursor particles have a weight average particle size of not greater than about 5 μm.

91. A method as recited in Claim 81, wherein no more than about 0.1 weight percent of said phosphor particles are in the form of hard agglomerates.

92. A method as recited in Claim 81, wherein said phosphor particles have an average size of not greater than about 5 μm and wherein said particles have not been milled.

93. A method for the production of a ZnS phosphor powder batch, comprising the steps of:

a) forming a liquid comprising precursors to a ZnS electroluminescent phosphor compound;

b) generating an aerosol of droplets from said liquid;

c) pyrolyzing said droplets to remove liquid therefrom and at least partially react said precursors to form intermediate precursor particles; and

d) heating said intermediate precursor particles to form a powder batch of phosphor particles.

94. A method as recited in Claim 93, wherein said step of generating an aerosol comprises ultrasonically atomizing said liquid.

95. A method as recited in Claim 93, wherein said liquid comprises thiourea.

96. A method as recited in Claim 93, wherein said liquid comprises zinc nitrate.

97. A method as recited in Claim 93, wherein said pyrolyzing step comprises pyrolyzing said droplets at a temperature of at least about 700°C.

98. A method as recited in Claim 93, wherein said heating step comprises heating to a temperature of from about 1100°C to about 1600°C.

99. A method as recited in Claim 93, wherein said heating step comprises heating in a sulfur-containing gas.

100. A method as recited in Claim 93, wherein said heating step comprises heating in H_2S gas.

101. A method as recited in Claim 93, wherein said heating step comprises the step of heating said intermediate precursor particles with agitation.

102. A method as recited in Claim 93, wherein said heating step comprises the step of heating said intermediate precursor particles with sufficient agitation to substantially prevent the formation of hard agglomerates in the phosphor powder.

103. A method as recited in Claim 93, wherein said heating step comprises heating said intermediate precursor particles in a rotary kiln.

104. A method as recited in Claim 93, wherein said intermediate precursor particles have a weight average particle size of not greater than about 5 μm.

105. A method as recited in Claim 93, wherein no more than about 0.1 weight percent of said phosphor particles are in the form of hard agglomerates.

106. A method as recited in Claim 93, wherein said phosphor particles have an average size of not greater than about 5 μm and wherein said particles have not been milled.

107. A method for the production of a thiogallate phosphor powder of the form $M^2Ga_2S_4$, comprising the steps of:

a) forming an liquid comprising precursors of a metal M^2 and gallium;

b) generating an aerosol of droplets from said liquid;

c) pyrolyzing said droplets to remove liquid therefrom and at least partially react said precursors to form a particulate intermediate precursor comprising at least a first oxide of metal M^2 and gallium; and

d) heating said particulate intermediate precursor form said thiogallate phosphor powder.

108. A method as recited in Claim 107, wherein said metal M^2 is selected from the group consisting of Ca, Sr and mixtures thereof.

109. A method as recited in Claim 107, wherein said intermediate particulate precursor has a weight average particle size of not greater than about 5 μm.

110. A method as recited in Claim 107, wherein said precursors comprise nitrate salts.

111. A method as recited in Claim 107, wherein said pyrolyzing step comprises heating said droplets to a temperature of from about 700°C to about 900°C.

112. A method as recited in Claim 107, wherein said liquid further comprises a precursor to an activator ion.

113. A method as recited in Claim 107, wherein said heating step comprises contacting said intermediate particulate precursor with a sulfur-containing solid, liquid or gas composition at an elevated temperature.

114. A method as recited in Claim 107, wherein said heating step comprises contacting said intermediate particulate precursor with a gas composition comprising H_2S.

115. A method as recited in Claim 107, wherein said heating step comprises heating said intermediate particulate precursor to a temperature of from about 800°C to

about 1100°C.